FIRST SERIES, No. 168 DECEMBER 1, 1928

UNIVERSITY OF IOWA STUDIES

STUDIES IN CHARACTER

VOLUME II NUMBER 3

A COMPARATIVE STUDY OF THOSE WHO REPORT THE EXPERIENCE OF THE DIVINE PRESENCE AND THOSE WHO DO NOT

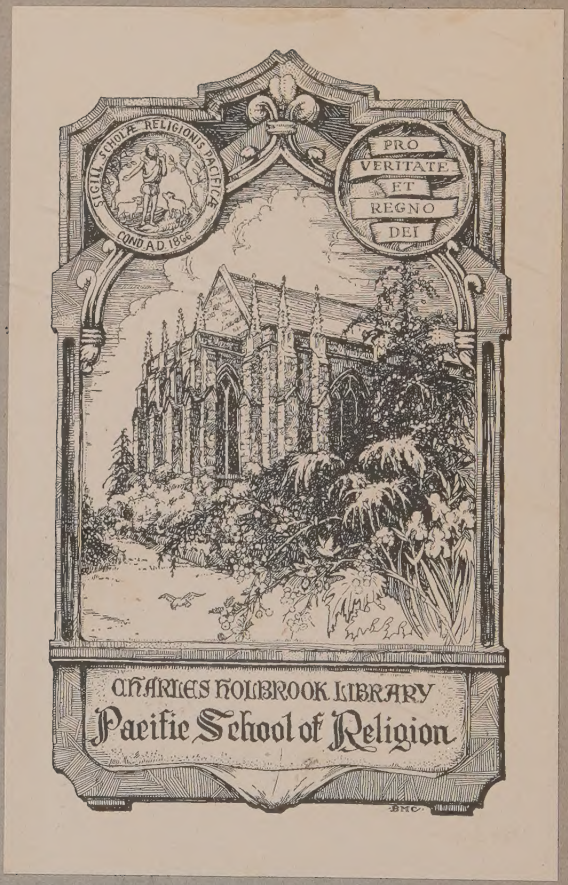
by

ROBERT DANIEL SINCLAIR, PH.D.

BL
51
S53
1928
v.2 no.3
GTU
Storage

PUBLISHED BY THE UNIVERSITY OF IOWA, IOWA CITY, IOWA

Issued semi-monthly throughout the year. Entered at the post office at Iowa City, Iowa, as second class matter under the Act of October 3, 1917.


SIGILL. SCHOLÆ RELIGIONIS PACIFICÆ
COND. A.D. 1866
PRO
VERITATE
ET
REGNO
DEI
CHARLES HOLBROOK LIBRARY
Pacific School of Religion
BNC

UNIVERSITY OF IOWA STUDIES IN CHARACTER

EDWIN D. STARBUCK, Editor

FROM THE INSTITUTE OF CHARACTER RESEARCH

VOLUME II NUMBER 3

A COMPARATIVE STUDY OF THOSE WHO REPORT THE EXPERIENCE OF THE DIVINE PRESENCE AND THOSE WHO DO NOT

by

ROBERT DANIEL SINCLAIR, PH.D.

HOLBROOK LIBRARY
PACIFIC SCHOOL
OF RELIGION

GRADUATE THEOLOGICAL UNION
GTU
LIBRARY
1962

PUBLISHED BY THE UNIVERSITY OF IOWA, IOWA CITY, IOWA

March, 1930

33953

PV53.5
I09
v. 2, no. 3

TABLE OF CONTENTS

Chapter	Title	Page
	Foreword	5
	Acknowledgments	7
I	Introduction	9
II	Methods of Differentiating the Groups	11
	The Problem	11
	Selection of the Groups for Study	13
	Reliability and Validity	14
III	Experimental Differences between the Groups	16
	Sensory Characteristics	16
	Motor Abilities	21
	Intellectual Traits	28
	Suggestibility	34
IV	Personal Data about the Respondents	39
	Self-Rating Scale	39
	Church Affiliations	40
	Sex Differences	41
	Personal Data Questionnaire	43
V	Review and Statement of Conclusions	50
	Bibliography	55
	Appendix I	57
	Appendix II	63
	Appendix III	65

1
53
28
2 no.3

FOREWORD

The psychology of religion, although it has enjoyed about a third of a century of slow development, is now, doubtless, about in the condition of physics in the days of Galileo, or experimental psychology at the time of Fechner. It will prosper. Its release has awaited, not interested students, but techniques and tools adequate to the prosecution of any objective science. Some of these devices have been discovered and applied in this study of the mentality of those persons who experience feelings of immediacy of rapport with spiritual verities. The mechanisms used in the study make possible four things almost always characteristic of the objective sciences at their best: the reduction of bodies of data to quantitative determination; the use of objective measures of the stuff handled, as illustrated in the employment of laboratory methods; the use of correlations to determine the reliability of data of a quasi-quantitative nature; and the constant validation of conclusions. This research, together with the companion one by Dr. Howells on conservatives versus radicals, represents probably the first attempt to apply strictly controlled empirical methods, including experimental, to the study of religion.

EDWIN D. STARBUCK

ACKNOWLEDGMENTS

The writer wishes to express appreciation to his teacher and friend, Dr. Edwin Diller Starbuck, for the suggestion of the problem involved in this study and for his untiring effort toward its solution. The writer is also indebted to his wife for her part in this work. Without her cheerful assistance and encouragement the completed work could not have been possible. Credit is due Dr. Frank K. Shuttleworth for help given in solving statistical problems connected with the study. To the instructors, assistants, and students in the department of psychology of the University of Iowa the writer is especially grateful. It was through their coöperation that the data for study were made available. Whatever merit the work possesses is due in large measure to the assistance and inspiration given by these persons and due acknowledgment is accordingly made.

CHAPTER I

INTRODUCTION

There has been rather wide-spread in the world a type of persons, interesting and somewhat spectacular, who profess having had intimate communion with the Divine Being. They describe it variously: the presence of the Holy Spirit, the feeling of God's love, the sense of communion, divine leadings, irresistible intuition, oneness with the Infinite, indescribable awe, dreamy states, divine promptings, cosmic consciousness, and satisfying inner experiences. Pronounced forms of this sort of experience have been revealed in characters of historic importance. Joan of Arc is declared to have said, "I know I'm right; the voices." George Fox followed "the light within." St. John of the Cross reached the "union of love" through "dark contemplation." And St. Theresa felt the presence of the Lord Christ sitting by her side and whispering words of endearment in her ears.

There have been equally distinctive individuals whose lives were marked by no such experiences. Such persons may work and plan for world betterment, enjoy human fellowship, and live in accordance with the highest moral standards. But they are not conscious of intimate communion with a Divine Being; they never have felt the presence of the Holy Spirit; nor do they make a definite attempt to know God's will, as such. If religious at all, their devout moments are relatively unfervid and colorless.

It is likely that a comparative study of each type with reference to the other may bring to light more clearly than in any other way the hidden mechanisms that condition the mystical experience which those of the first type profess to have. This possibility was the incentive for the present investigation. The desire has been to learn what constitutes the real setting for the presence or absence of this experience, that rôle which it plays in the lives of individuals, and the characteristics of the people in whom it is found; in other words, to uncover whatever fundamental differences exist between the two types of individuals.

It should be made clear from the start that no attempt was made to obtain a description of the religious states and experiences them-

selves. Volumes of such descriptions have already been written, critical and uncritical. What was desired was an objective, analytical and distinctly empirical study of those who experience the presence of a spiritual being and of those who do not, rather than a description of the experiences themselves, as experiences. The purpose was to gain an understanding of the psychology that distinguishes the former from the latter group.

For the solution of the problem, several considerations were involved. First, some means had to be invented for the selection of the groups to be studied. The traits in question could not be measured objectively, while such subjective measures as are usually employed were considered too unreliable. The procedure as finally worked out is taken up in detail in the following chapter. Second, tests had to be devised to measure those traits which, on hypothetical grounds, were thought to be factors in the religious experience. These tests, with the findings and their interpretations, are described in Chapter III. Third, a questionnaire was prepared on personal items, supplementary to the experimental data. These findings and other relevant information about the respondents are dealt with in Chapter IV. Chapter V contains a summary of the study and a statement of conclusions.

CHAPTER II

METHODS OF DIFFERENTIATING THE GROUPS

The Problem

The first step in the investigation was to find a representative number of individuals who did or did not profess the experience of the Divine Presence. It was obvious that the only way to do this was to rely upon the confessions of the individuals themselves. Usually the questionnaire has been the resort of the investigator in such a case, and there is no doubt that it is a valuable and effective means of gathering certain types of information. But its usefulness seems to be limited to the kind of facts that the respondents can observe and describe with scientific accuracy. Few persons, if any, are qualified to observe scientifically such subjective processes as occur in the mystical experience and to give exact or even approximately accurate statements regarding them.

Because of this, the questionnaire method was considered too unreliable for the purpose of this study. What was needed was some device by which accurate statements could be secured from the respondents, and also objective proof of the truth of their reports. In short, the data must be obtained in quantitative form and be capable of statistical treatment.

A Point-Scale Self-Rating test, devised with the aid of Professor Edwin D. Starbuck, promised to meet the requirements. In the test each person was asked to rate himself on more than a hundred pairs of contrasting qualities or character traits. In the first half of the test a dotted line of eleven points, the middle one being a colon, connected each pair of qualities on which the person was to rate himself. For example:

Always healthful	. . . . . :	Extremely delicate
Very dark hair	. . . . . :	Very light hair
Kindliness	. . . . . :	Cruelty

If the rater thought he had about an equal amount of each quality at the extremes of the line, he would check the colon at the center of the scale; if more of one quality than the other, he would check to the right or to the left of the colon as far as best represented his case.

The second part of the rating scale differed from the first in that

the colon was placed at the end of the line, indicating simply the absence of the trait or quality. For example:

Enjoy art	. . . . .	: No particular interest in art
Very often submissive	. . . . .	: Never submit

This device permitted the measuring of characteristics which could not readily be paired with an opposite.

The method has several distinct advantages. From the nature of the test itself, each check put upon the scale indicates a quantitative measure of the respondent's opinion about himself on that particular trait, a rough numerical estimate of how he thinks he stands as compared with the average individual. Take the third item in the earlier list, for instance. The question is not: "Are you kind?" or "Are you cruel?" or "Would you rather be kind or cruel?" The proposition is, "Regarding kindliness and cruelty, just where do you stand as compared with the average individual? If you are average, check the colon in the middle of the scale; if not average, check to the right or to the left of the colon as far as most accurately represents your case as it appears to you—not as you might like it to be."

Seven features of this scale are outstanding: (1) The field of discourse within which the respondent's judgment must be made is definitely limited. (2) The subject has a new alphabet, so to speak, with which to spell out his characteristics as they appear to exist. (3) He is limited to definiteness of response in quantitative terms. (4) The scale of judgment he uses contains units that remain fairly constant when applied to a variety of situations. (5) The contrasting pairs of traits focus attention sharply on the matter at hand. (6) Care in preparation of items insures that they contain logically and psychologically true opposites; and finally, (7) A check can be made on the reliability of the confessions, because they are expressed in quantitative terms and yield to statistical treatment.

A preliminary try-out with 549 elementary psychology students in the spring of 1925 indicated that this type of test was in general an appropriate and reliable tool for the separation of contrasting groups or characteristics. The intercorrelations which were run between items and between groups of items that were logically related were high. Some few of the items showed that they were too ambiguous or unreliable to be of use; but the larger number proved their worth and were retained in a revised form of the

test, to which some new items were added. These expanded it to more than a hundred different points. Among these, eight had particular reference to the aspect of religious experience which was under investigation.

The revised test was altered in one other respect; the rating scale was reduced from eleven to seven points in length. Eleven steps had proved somewhat unwieldy for the respondents to handle, and the units of a seven-point scale seemed refined enough for the purpose at hand. This second test (see Appendix I) was given to an elementary psychology class of five hundred and fifty students in the spring of 1926. It was taken during the first part of the regular class hour. As in the previous test, the individual was asked to consider each pair of qualities or traits as applying to himself and then to mark on the dotted line the one of the seven points which best represented his case, on the scale of diametrically opposite traits or tendencies. The time was limited so that the distribution of the tests, the marking, and the collecting of them were completed for each group in twenty-five minutes.

Selection of the Groups for Study

The data from this testing furnished the material for selecting two opposed groups in regard to the experience of the Divine Presence. As has already been noted, there were eight items which seemed logically related to this experience. They were as follows:[1]

Feel in harmony with Divine purpose	. . . : . . .	Feel out of harmony with Divine purpose
Have sometimes felt the presence of the Holy Spirit	. . . . . :	No such experience
Have had moments of satisfaction of immediate communion with a Divine Presence	. . . . . :	No such experience
Have intimate feeling of God's love	. . . . . :	Do not have such feeling
Implicit faith in prayer	. . . : . . .	No faith in prayer
Have a satisfying inner experience in religion	. . . . . :	No such experience
Seem to have Divine leadings and promptings	. . . . . :	No such leadings and promptings
Seek to know God's will	. . . . . :	No such effort

[1] See Appendix I, items 39, 75, 82, 87, 98, 104, 105, 106.

These items were distributed at random among the 110 items of the test, in order to insure, as far as possible, a new and independent judgment in each instance. It was easy, however, to single out the scores on each of these points and to combine them into a total score with reference to the mystical experience. Numerical values were assigned to each of the seven steps in the scale, from 6 at the extreme left of the scale to 0 at the extreme right. The scores of each person on each of the eight items were then totalled.

Those who rated themselves on one or the other of the two extreme left points for each of the eight items, making a total score of at least 40, were separated out to form the group of students who judged themselves as extremely conscious of the Divine Presence. In order, however, to raise the number in the group to an even 50, it was necessary to add 9 individuals whose total scores were only 39. Those who rated themselves on the two points at the extreme right of the scale for each of the eight items made up the contrasting group. A sufficient number of cases to match the 50 of the other extreme were obtained by limiting the group to those whose total scores on the eight items were not more than 6.

These hundred students, fifty representing the extreme mystics and fifty representing the extreme non-mystics, became the subjects of detailed experimentation. They are designated in the following pages as the "Positive group" and the "Negative group" respectively.

Reliability and Validity

As a check on the reliability of the markings on this test, the ratings on the eight significant items made by the whole distribution of 549 cases were treated statistically by the method of chance-half correlation. The totaled scores of a random four of the items were set against the totaled scores of the remaining four according to the usual procedure. The resulting correlation was .859, a very satisfactory chance-half index of reliability. According to Brown's formula, the test as a whole has a statistical reliability of .924.

This correlation means that if a similar test affecting the same classification as the first were given to the same group, the chances are 58 in 100 that this second test would place the same individuals in the same one-tenth of the distribution, and there are approximately 99 chances in 100 that a case would not be displaced further

than into the adjacent tenth.[2] Furthermore, the membership of the two extreme groups would not be varied by more than 16 cases. The chances that any one of these 16 cases would be displaced as much as two "tenths" in a second test are less than 1 in 1000, and that any case selected for either group might be displaced more than two "tenths," or enough to make it fall on the other side of the median and thus change its classification from Positive to Negative or vice versa, are infinitesimal.

The validity of the group placement was further confirmed by the personal testimony of the individuals themselves in reply to a questionnaire which they received some months after taking the self-rating test. Many of the replies, which are considered in Chapter IV, emphasize the distinguishing characteristics of the two groups.

It seems clear from the nature of the test, from the kind of information requested, and from the high reliability of the responses that the scores on the eight Divine Presence items are reasonably valid. The test is evidently quite able to separate out of a miscellaneous group those who are definitely mystical or non-mystical in their experience. The two groups of fifty which rank themselves at the extremes of the distribution are sufficiently distinct from each other to be regarded as valid subjects for the experimentation which followed.

---

[2] Otis, A. S., Statistical Methods in Education, 1925, p. 225.

CHAPTER III

EXPERIMENTAL DIFFERENCES BETWEEN THE GROUPS

At this point it might be worth while to take a fresh look at the problem. The situation was this: there were available for research purposes two groups of students. One group professed to have implicit faith in prayer, to possess a satisfying inner experience in religion, to feel in harmony with the Divine purpose, to have known the presence of the Holy Spirit, to have had the satisfaction of immediate communion with the Divine Presence, to have experienced intimate feelings of God's love, and to be directed by divine leadings and promptings in whatever they did. That is, the group reported positively on all of the items usually considered indicative of mystic rapport with some divine being. The other group, swinging to the opposite extreme, denied any experience of these feelings and beliefs, and claimed to make no effort to gain any intimacy with a higher power.

Many questions at once arise regarding these two extremes. Are the differences between the groups real in terms of differences in mental and physiological functions or traits? If subjected to a battery of tests that would try out such abilities as sensory discrimination, coördination of movement, susceptibility to pain, fatigue or suggestion, intelligence function, memory, imagination, and the like, would the groups reveal significant divergencies such as might account for their opposite reactions to the Point-Scale questionnaire? Or are the differences after all mere reflections of social attitudes, instead of the effects of deep-seated native equipment and capacities? For the purpose of discovering some answer to this question, the members of each group were subjected to a series of experiments, all but six of which were given as individual tests. The description of these experiments, with the findings from them, is the content of the present chapter.

I. Sensory Characteristics

Among the powers which are commonly attributed to the mystic is that of acute sensitivity to delicate stimuli. His receptor mech-

anisms are supposed to be more finely tuned to the external environment than those of other people, so that he is able to respond to excitations which are too slight to arouse the sense-organs of the average individual. Now the means for testing out this theory in the laboratory are rather well developed. For this reason, a battery of tests was devised, tapping the capacity of the sensory mechanism at a number of different points. One test measured acuteness in vision, another tested the speed and accuracy of muscle response, five worked with the processes of audition, and three measured sensitivity to electrical stimuli.

1. Visual Discrimination

The visual acuity of the two groups was measured by testing their ability to distinguish very small differences in brightness, in the form of slight variations in the shades of gray papers. Twenty shades of gray of varying degrees of difference from a standard gray were presented with the standard gray by means of the customary tachistoscope. The order in which the paired papers were exposed was determined by chance selection, but was standardized for all the observers. The subjects were asked to record their judgments as to whether the compared gray was lighter or darker than the standard gray.

In all, forty judgments were obtained from each subject. Scores were computed on the basis of the number of right discriminations made. Errors were also weighted according to the degree of error made, totaled, and divided by the number of trials, giving the average amount of error for each trial. The results are summarized in the following table:

TABLE 1

Average Scores of the Positive and Negative Groups on Visual Discrimination Test

	Positive			Negative			Observed Diff. / P.E. of Diff.
	A.M.	S.D.	N	A.M.	S.D.	N	
No. right	37.12	1.50	50	37.48	1.40	50	1.86
Error	.13	.13	50	.12	.13	50	.77

Both methods of scoring the test failed to yield any large difference between the two groups. The observed differences between the means are 1.86 and .77 times the respective probable errors of difference, and therefore not statistically significant.[3] The slight

[3] The ratio of the observed difference to the probable error of the difference

advantage which the Negative group shows on this test would probably not repeat itself if the tests were given to any other similar group.

2. Weight Discrimination

For this test, which involves both cutaneous pressure and sensations of muscle, joint and tendon, a set of measures was made by weighting uniform cardboard boxes on the inside. They were cartridge style, 2″ long and 1″ in diameter, and consisted of a standard of 80 gr. with twenty other comparison weights in series from 60 to 100 gr., at 2-gr. intervals.

In administering the test, a container for the weights was used which placed the standard weight of 80 gr. in a position nearest the right hand of the experimenter and kept the variables always in a standardized order, previously determined by chance selection. The observer was seated in a chair so that his elbow and forearm rested comfortably on the table, the elbow being used as the fulcrum for movement rather than the wrist. The standard 80 gr. weight was lifted before each variable, and the observer reported "heavier," "lighter," or "the same" for the variable, depending upon whether he thought it was heavier, lighter, or the same in weight as the standard.

The score for each observer was the number of right discriminations and the average error in grams. The mean scores and standard deviations for each of the groups are given in the following table:

TABLE 2

Average Scores for the Positive and Negative Groups on Weight Discrimination Test

	Positive			Negative			Observed Diff. / P.E. of Diff.
	A.M.	S.D.	N	A.M.	S.D.	N	
No. right	15.32	1.88	50	15.40	1.84	50	.32
Errors in grams	1.45	.79	50	1.34	.88	50	1.00

———

indicates the likelihood that as large or larger differences would occur by chance in repeated trials of the same test on exactly similar groups. Thus, for various ratios the chances are:

Ratio	Likelihood of a Similar Diff. Occurring	
1	1 in	2 times
2	1 "	5 "
3	1 "	20 "
4	1 "	142 "
5	1 "	1,250 "
6	1 "	20,000 "

The slight differences between the Positive and the Negative groups are without statistical significance.

3. Sensitivity to Electric Current

A direct current[4] operating through a galvanometer was used in this experiment. The electrodes were spring clamps insulated at the side that applies to the back of the finger and thumb so that the current had always to pass through the front part of the finger.[5] (See Appendix III, Figure 1.) These were always attached to the thumb and middle finger.

Three measures were obtained in all: the lower limen of sensitivity to the current, the lower threshold for pain as distinguished from mere sensation, and the maximum amount of current the individual was willing to stand. The readings were taken from the galvanometer, which registers the actual amount of current passing through the circuit and not the voltage applied to the body. For convenience and accuracy in reading, the scale on the galvanometer was calibrated into proportional units, each one approximately equal to six microamperes. The score in each case was the average of five trials, given successively. The data for the two groups are summarized in Table 3.

TABLE 3

Average Scores for the Positive and Negative Groups on Sensitivity to Electric Current

	Positive			Negative			Observed Diff.
	A.M.	S.D.	N	A.M.	S.D.	N	P.E. of Diff.
Threshold of Sensation	12.34	4.00	50	13.47	7.70	50	1.69
Threshold of Pain	25.51	15.12	50	29.87	18.91	50	1.88
Maximum Pain	85.75	50.54	50	126.88	57.12	50	5.67

As far as these data indicate, there is no important divergence

[4] The direct current was derived from an ordinary alternating current of 110 volts, which was first passed through a transformer, reducing it to 20 volts. The current was then carried through a high voltage transformer, on one side of which was a control rheostat of 120 ohms resistance and on the other side a switch key not visible to the observer. The secondary current was that used for the experiment. A rectifier changed it to a direct current, which was passed through a vacuum tube, and thence through the galvanometer and the right hand of the observer.

[5] This precaution was taken because the current was found to give pain at the base of the hairs if applied to the outer surface of the finger. The reports of the observers proved unreliable when the wire of the electrode was clamped exactly over the joint. For these reasons the contacts were made on the fleshy parts of the finger and thumb nearest the palm.

between the two groups in the lower limen of sensitivity to electricity, nor in the lower limen of pain from electricity. The small differences that do exist point to the Positive group as the most sensitive in both cases. The tendency here is contrary to the results obtained in visual and weight discrimination, in which the Negative group appeared the more sensitive. For maximum pain, however, there is a very marked difference, the Negative group being distinctly more willing to stand a large amount of pain. This is difficult to explain in the light of the fact that the pain thresholds of the two groups are practically equal. If it should develop on further testing that the negatives are really less sensitive to pain, the matter would be cleared up. The present results are especially interesting because they are contrary to what the experimenters had expected from the historic accounts of religious martyrdom. The probability is that the martyrs who are reputed to have undergone inconceivable pain and torture without a murmur were no more anaesthetic than their persecutors, but were able to withstand their sufferings because of a highly wrought psychological condition impossible to duplicate under laboratory conditions.

4. Auditory Discrimination

The records of the members of these groups on the Seashore Music Tests[6] were available and offered a reliable index of various auditory capacities. These tests, as is well known, measure the ability to discriminate slight differences in pitch, in intensity of sound, in time-length of intervals, in rhythmic patterns, and in the affective quality of musical consonances. The scores are converted into percentile rankings, and it is from these that the data in Table 4 have been compiled.

TABLE 4
Average Scores for the Positive and Negative Groups on Seashore Music Tests

	Positive			Negative			Observed Diff.
	A.M.	S.D.	N	A.M.	S.D.	N	P.E. of Diff.
Rhythm	65.23	27.75	47	71.78	26.89	41	1.66
Pitch	43.27	31.23	44	43.38	31.80	44	.02
Intensity	51.48	25.38	45	49.22	32.17	44	.54
Time	47.82	32.59	46	53.04	32.58	42	1.10
Consonance	52.06	27.95	49	51.06	29.57	49	.20

[6] Seashore, C. E., Manual of Instructions and Interpretations for Measurements of Musical Talent. Columbia Graphophone Company, New York City.
Seashore, C. E., The Psychology of Musical Talent. Silver Burdett and Company, 1919.

None of the differences are statistically significant, nor are the very small differences that do exist consistently in favor of either group.

Summary of Findings from the Tests of Sensory Discrimination Tests

With one exception, the results of this group of tests were negative. The only significant difference noted was the amount of pain through electric shock that the two groups were willing to bear, the Negative group showing the greater endurance. This is not strictly a test of sensitivity. In no other cases did significant differences appear. So far as one can judge from the tests given, the difference between the groups is not related to the sensitivity of the physical senses.

II. Motor Abilities

A related field of inquiry into the physical makeup of the mystic is the motor system. Are there differences in precision, quickness, and coördination of movement, which distinguish him from the average individual, or from those individuals who stand most in contrast to him? Here also the laboratory is rich in devices for measuring these abilities. The members of each group were run through a special battery of motor tests, which included measures of single simple muscular reactions under pleasurable and annoying situations, and combinations of physical and mental reactions.

1. Simple Reaction Time

The simple reaction time of the groups was measured by the Klopsteg Chronoscope, according to the usual technique.[7] The score was the time in thousandths of a second which the observer required to respond to an auditory stimulus with a muscular reaction. In the following table, the means and standard deviations for each group are recorded:

TABLE 5

Average Scores for the Positive and Negative Groups on Simple Reaction Test

	Positive			Negative			Observed Diff. / P.E. of Diff.
	A.M.	S.D.	N	A.M.	S.D.	N	
Reaction Time	161.88	38.76	50	153.19	29.37	50	1.87

[7] Klopsteg, Paul E., "A New Chronoscope and Fall Apparatus," Journal of Experimental Psychology, Vol. 2, 1917, p. 252.

Here a difference is seen in favor of the Negative group, but one so slight as to be of no statistical significance.

2. Rate of Continuous Movement

Rate of continuous movement was measured by having the observer tap continuously on an ordinary telegraph key as rapidly as possible with the forefinger.

Each observer tapped two minutes and ten seconds. A record was kept of the number of taps made during the first sixty seconds and during the last sixty seconds. The number of taps for the first sixty seconds was taken as a measure of skill in the activity. A quotient of the number of taps in the second sixty seconds divided by that of the first period was read as an index of the fatigue which had set in. The average scores of the Positive and Negative groups are shown in Table 6:

TABLE 6

Average Scores for the Positive and Negative Groups on Tapping Test

Rate of	Positive			Negative			Observed Diff.
Tapping	A.M.	S.D.	N	A.M.	S.D.	N	P.E. of Diff.
1st 60 sec.	285.00	39.40	50	289.28	43.99	50	.75
Last 60 sec.	262.44	48.06	50	277.18	49.61	50	2.23
Ratio: last to 1st	.92	.11	50	.95	.10	50	3.80
Sum: 1st and last	547.44	83.00	50	566.46	88.92	50	1.63

From the table it will be seen that there is little difference in the rate of tapping during the first minute. During the second minute the Positive group tapped on the average only 92 per cent as many times as during the first minute, while the Negative group tapped 95 per cent as many times. The ratio 3.8 indicates that the difference is probably significant: there are 99 chances in 100 that it is not due to chance. This throws some light on the question as to which group possesses the greater physical endurance. The results indicate that the Positive group is more apt to fatigue quickly.

3. Muscle Steadiness

Accuracy, steadiness, or precision of movement was measured by the use of a device as follows.[8] (See Appendix III, Figure 2). A brass plate, set at an angle of 45 degrees and pierced with nine

[8] Whipple, Guy Montrose, Manual of Mental and Physical Tests, Warwick ad York, Baltimore, Md. 1910.

holes ranging in diameter from 13 mm to 2½ mm was connected in series with a battery, a sounding bell, and a metallic stylus. The test consisted of inserting the stylus in the holes and withdrawing it without touching the metal plate. The largest hole was entered first, then the next largest, and so on. The holes were numbered from 1 to 9, from the largest to the smallest. The number of the hole in which contact was first made with the plate, causing the bell to ring, was counted as the score made by the observer for that trial. Five trials were made with positive directions, such as, "Place the stylus exactly in the middle of the hole. Put it right in the center"; and, following this, five trials with directions stated negatively, such as, "Be careful not to touch the edge of the hole. Don't let the stylus come in contact with the metal," etc.

In a third set of five trials, an electric shock was substituted for the sound of the bell as the warning that contact had been made. The handle of the stylus was wrapped with tinfoil and connected in series with the rest of the apparatus. A metal electrode was attached to the thumb of the observer on the hand which did not hold the stylus. The observer was told, "We shall now proceed as before, but with this difference: the bell will not signal when contact is made, but instead you will get a shock which will be no greater than you are willing to bear." The amount of pain that the observer was willing to endure had already been determined (See page 19).

Steadiness was also measured by the use of the tracing board.[9] This test consisted in passing the metal stylus along a narrow angular glass-lined trough between two metal strips and noting, when warning was given by the electric bell, the portion of the trough traversed without bringing the stylus in contact with the metal strips. The measure was taken from an attached centimeter scale. The first five trials were given under negative instructions, and the second under positive. Five additional trials were made under the expectation of pain from electric shock, with the apparatus adjusted as in the previous test. In all fifteen trials the arm and hand were entirely free from support. The results are shown in Table 7.

---

[9] Whipple, Guy Montrose, Idem.

TABLE 7

Average Scores for the Positive and Negative Groups on Steadiness Tests

	Positive			Negative			Observed Diff. / P.E. of Diff.
	A.M.	S.D.	N	A.M.	S.D.	N	
Holes, positive directions	22.08	3.50	50	22.16	4.29	50	.15
Holes, negative directions	22.22	3.49	50	21.94	3.48	50	.59
Holes, with pain	26.64	4.93	50	23.92	5.50	50	3.96
Trough, positive directions	89.90	15.16	50	87.85	20.20	50	.85
Trough, negative directions	84.66	18.68	50	85.41	22.17	50	.27
Trough, with pain	98.36	16.41	50	97.03	25.83	50	.45

No differences appeared in the muscle steadiness of the two groups with either apparatus, nor under either type of instruction. In the case of the holes test, however, when muscle steadiness was motivated by pain the Positive group made the better score. The difference does not appear in the trough test. It will be recalled here that in the Weight Discrimination Test, which also involved sensations of muscle, joint, and tendon, no significant differences appeared. The relation of this test to the question of suggestibility will be considered later in the chapter.

4. Muscle Coördination

The pursuit apparatus was used for the purpose of measuring the acquisition of skill in coördination of eye and hand movement.[10] In this experiment, the observer was asked to keep a hinged pointer in continuous contact with a brass target, 1.9 in diameter, which rotated on a phonograph disc at a distance of 8 cm. from the center. The disc of the phonograph was controlled to make one rotation per second; a Veedler counter recorded in tenths of a second the amount of time the observer was able to maintain the contact.

Two minutes and ten seconds were allowed for the test, and record was kept of the score for the first sixty seconds and for the last sixty seconds. The computations are given in Table 8.

Table 8 indicates that the Negative group are much more skill-

[10] Koerth, Wilhelmine, "The Pursuit Apparatus: Eye-Hand Coördination," Studies in Psychology, State University of Iowa, Vol. 8, 1922, pp. 288-292.

TABLE 8

Average Scores for the Positive and Negative Groups on Eye-Hand Coördination Test

	Positive			Negative			Observed Diff.
	A.M.	S.D.	N	A.M.	S.D.	N	P.E. of Diff.
1st 60 seconds	37.16	39.40	50	80.95	52.00	50	6.92
Last 60 seconds	52.95	60.80	50	110.81	75.40	50	6.16
Ratio: last/1st	2.04	3.25	50	1.62	1.37	50	1.26
1st plus last	90.12	100.87	50	191.75	124.40	50	6.54

ful than the Positive in their eye-hand coördinations. The ratios 6.92, 6.16, and 6.54 give these differences a high degree of statistical significance. The Negative group made a somewhat greater absolute improvement during the second minute, but relative to the skill shown in the first minute, the proportional improvement of the Positive group is greater. The difference, however, is not statistically significant.

In the Weight Discrimination Test and in most of the steadiness tests, which also involve muscle and tendon, no differences of significance were found. The question naturally arises as to whether the scores on this test may be due to mental rather than to physical differences. In the next test to be reported and in still other tests this hypothesis will be subjected to more careful examination.

5. Serial Reaction

Serial Reaction time was measured by a machine which had been devised in the psychological laboratory of the State University of Iowa. It consisted of a smooth dial 13″ in diameter which faced the observer. Behind it was supported a circular cardboard of equal size, bordered with a row of color spots 3/16″ in diameter. The colors were red, yellow, green, and blue, placed in chance order. Four small keys (levers) at the front and bottom of the machine were used to rotate the cardboard with the color spots back of the dial. The observer could see the color spots one at a time through a small aperture at the top of the dial.

When a certain color spot appeared in the aperture it could be made to disappear to the right by pushing one of the four keys at the bottom of the frame, each color being connected with a certain one of the keys. At the same time that one color spot disappeared another of a different color was brought into view through the aperture. The observer was to learn which key would cause

each color to disappear from the aperture and then to make the color spots move on as rapidly as possible. The time for completing the circle of color spots was recorded and also the number of errors made during each ten seconds period. The average results for the two groups are given in Table 9.

TABLE 9

Average Scores for the Positive and Negative Groups on Serial Reaction Test

	Positive			Negative			Observed Diff.
	A.M.	S.D.	N	A.M.	S.D.	N	P.E. of Diff.
Serial Reaction							
Time	152.76	61.53	50	128.08	36.88	50	3.60
Total Error	36.50	31.79	50	25.16	20.28	50	3.15
1st quarter	11.88	8.22	50	10.14	5.05	50	1.89
2nd "	8.90	8.19	50	6.10	6.06	50	2.88
3rd "	7.82	8.31	50	4.54	6.71	50	3.22
4th "	7.92	9.02	50	4.38	5.28	50	3.55

The table indicates that the Negative group were much quicker in response and consistently more accurate. The results are what one might reasonably expect, since the Negative group surpassed in muscle coördination and rate of tapping. Since in the experiment an element of learning is involved, the mental factor is also important. The results suggest that, on the whole, the Negative group is mentally more alert and more capable of learning.

6. Tracing Mazes

Another attempt was made to measure ingenuity and alertness by the use of pencil mazes. Five mazes of varying degrees of difficulty were chosen: three were Porteus' Tests, Years XI, XII,, and XIV,[11] but with the starting point taken at the outside instead of in the center; one was a very slight modification of the Hampton Court maze; and one of much greater difficulty was devised by the experimenter.

The score was recorded in seconds. For some who were unsuccessful in the most difficult maze, time was called at the end of five minutes. The mean time and the standard deviation for each group on each of the mazes were calculated, as well as the per cent of each group completing mazes 4 and 5. The results are presented in Tables 10 and 11.

The Negative group were somewhat quicker than the Positive

[11] Porteus' Test, Vineland Revision, C. H. Stoelting Co., Chicago, Illinois.

TABLE 10

Average Scores for the Positive and Negative Groups on Maze Tests

	Positive			Negative			Observed Diff.
	A.M.	S.D.	N	A.M.	S.D.	N	P.E. of Diff.
Maze 1	31.45	11.76	50	24.62	7.35	50	5.17
Maze 2	15.59	8.62	50	13.96	7.72	50	1.81
Maze 3	16.23	6.81	50	13.80	4.86	50	3.04
Maze 4	80.45	52.80	50	60.11	27.11	50	3.48
Maze 5	229.97	66.22	50	196.19	74.71	49	3.52

TABLE 11

Per cent of Groups Finishing Mazes Number 4 and 5

	Positive	Negative
Maze No. 4		
Per cent finishing	92	98
Per cent having time called	2	0
Per cent giving up	6	2
Maze No. 5		
Per cent finishing	54	78
Per cent having time called	28	14
Per cent giving up	18	8

group on all the mazes. On the first maze the difference is clearly significant. On mazes 4 and 5, the number of the Positive group who gave up without taking their full time is more than twice as large as the number in the Negative group who quit before they were required.

So far as quickness of movement is a factor in tracing the mazes, the results corroborate the findings on the Tapping Test. Although no record was made of the number of errors, the greater speed of the Negative group may have been due to avoidance of error, as in the Serial Reaction Test (See Table 9). In so far as mentality is a factor in maze tracing, the results are in favor of the Negative group. This corresponds with the findings on the Coördination Test and the Serial Reaction Test.

Summary of Findings from Motor Abilities Tests

In summarizing the findings of this group of tests, it will be enlightening to divide them into two types: first, those that involve little more than a simple motor reaction; and second, tests of complicated reactions involving central control. On the first type of test, little difference appears in the abilities of the two groups. In simple reaction time and in rate of tapping the two groups are practically on a par with each other, except as the factor of fatigue

enters in. The same is true of the test of muscle steadiness, the only deviation occurring in the use of the holes apparatus when motivated by penalty of pain. In contrast to this similarity in simple motor skill is the marked superiority of the Negative group on tests of more complicated performance that involve intelligence. In the coördination tests the observed advantage was so large that it could not occur by chance more than once in 20,000 times. While the corresponding probabilities for serial reaction and maze tracing were not quite so large, the data show conclusively the superiority of the Negative group.

III. Intellectual Traits

The findings from the last series of tests seem to indicate a difference in mental ability between the groups. The present section of the chapter reports the findings on traits that are more specifically intellectual, such as memory, imagination, reason, and general intelligence.

1. Memory

Two measures of memory were taken, both administered as group tests.

(1) *The Picture Test.*

In this test, the observers were asked to attend to a picture for a period of thirty seconds, under carefully standardized conditions. (See Appendix III, Figure 3). The picture was then removed and after an interval of ten seconds the observers were required to answer twenty-five questions on a prepared form. Two minutes were allowed for this. Most of the questions were of the suggestion type, and will be discussed in a later section of the chapter. Nine of them, however, involved specific points of discrimination about the details of the picture:

How many boats are there in the picture?
How many towers are there in view?
How many turrets on the main tower?
Are there any trees in the picture?
Are the windows in the main tower rectangular?
Was there a clock in the largest tower?
How many faces of the clock are showing in the picture?
Is there a bridge showing anywhere?
Did you see the flag staff on the largest tower?

The papers were scored on the basis of the number of correct answers. The averages for the two groups follow:

TABLE 12

Average Scores for the Positive and Negative Groups on Discrimination Questions of Picture Test

	Positive			Negative			Observed Diff. / P.E. of Diff.
	A.M.	S.D.	N	A.M.	S.D.	N	
Questions answered correctly	3.48	1.61	49	3.82	1.65	50	1.55

This test, measuring observation and memory factors, does not reveal any significant differences between the two groups, although the Negative group seems to have a slight advantage.

(2) *The Aussage Test*

This test was used to eliminate any factor of familiarity which might have affected the results of the previous experiment. The apparatus employed is an Aussage board (See Appendix III, Figure 4), on which are placed a large number of simple and easily recognized objects. These are exposed to the observers' view for thirty second. The observers are then given three minutes in which to write the names of as many objects as they can remember.

This test measures more than one single element of mentality. It demands capacity to observe, retain, recall, and report. Differences in score might be due to misdirected attention, mal-observation, errors of memory, lack of caution or of zeal for accurate statement, scanty vocabulary, injudicious phraseology, or deliberate intent to mislead. Many of these objections were met and overcome in the making of this test. Of course, an experimenter cannot be sure that he has control of the attention of an observer. But under carefully standardized conditions, the test can be made reasonably reliable. Attention was directed to the Aussage when the test was to be given, and any distractions in the immediate surroundings were constant for the group. The lighting of the room, the placing of the board, and the seating of the observers were all calculated to overcome mal-observation. The difficulty of phraseology or lack of vocabulary was met by having the objects on the board ones which are in common use. In short, the effort was to measure memory ability as free as possible from other factors. The average results are shown in Table 13.

The data in the table indicate that the differences between the groups are not statistically significant. Those that do exist are

TABLE 13

Average Scores for Positive and Negative Groups on Memory Test

	Positive			Negative			Observed Diff. / P.E. of Diff.
	A.M.	S.D.	N	A.M.	S.D.	N	
Number right	13.78	2.12	50	14.34	2.87	50	1.65
Number wrong or repeated	.76	1.37	50	.68	.81	50	.55

in favor of the Negative group and are consistent with the results obtained from the preceding test.

3. Ability to Follow Directions

From tests of accuracy of observation and memory the study turned to the more distinctly intellectual abilities. One of these is the ability to follow directions. A slight modification of Woodworth and Wells' "Follow Written Directions" test was administered as a group test. A period of one minute and twenty seconds was allowed and the number of directions followed in that time was given as the grade. The number of errors for each individual was also recorded. The results follow in Table 14.

TABLE 14

Average Scores for Positive and Negative Groups on "Follow Written Directions" Test

	Positive			Negative			Observed Diff. / P.E. of Diff.
	A.M.	S.D.	N	A.M.	S.D.	N	
Number followed	12.84	6.35	50	13.70	6.24	50	1.01
Number wrong	1.16	1.13	50	.76	1.03	50	2.83

The factors scored on this test were speed and accuracy. The results, while they do not definitely establish that the Negative group is superior, strengthen the findings in the previous tests that it reacts more quickly and more accurately than the Positive group. In addition, there is evidence of superior comprehension of directions.

4. Ethical Discrimination and Abstract Judgment

In an attempt to measure other levels of intellectual ability a special test of ethical and abstract perceptions, constructed by Professor E. D. Starbuck, was used. It consisted in part of multiple choice items, some of which were concerned with questions of social relationships. The following is a sample item:

If one makes a promise he is unable to keep he should:
a. Make an explanation
b. Show the one to whom the promise is made so much consideration that he will forget it
c. Wait until he is asked about it
d. Try to avoid meeting the person

Other items required the definition of moral terms, such as:

Justice means
a. To have peace
b. To let everyone have what is coming to him
c. What the courts decide
d. To get your rights even when it is against the other fellow

A third type called for the exercise of moral judgments in matters of conduct, as:

The Golden Rule applies to
a. Business transactions only
b. Individual persons only
c. Your friends and enemies and to animals
d. Your intimate friends only

The last part of the test was constructed for the purpose of testing the ability of the groups to think in abstract terms. A sample follows:

Write an opposite of:	*Write an antonym of:*
1. Cause	1. Glee
2. Life	2. Faith
3. Mirth	3. Thing

Only a few of the individuals who took the test were able to reach this part in the allotted time. The results therefore have not been used in this study.

In scoring the tests, the first two parts were combined as a test of Ethical Discrimination, and the third part considered a test of Abstract Judgment. Each item called for two responses: the most appropriate, which was marked "B," for "best," and the least appropriate, marked "W," for "worst." The test had been sufficiently standardized so that a definite criterion for the correct responses was available. A score of 0, 1, or 2 was possible on each item. The maximum score attainable for the first part was 44, and for the second part 16. The results are shown in Table 15. The slight advantage which the Negative group appears to possess might easily be due to chance.

TABLE 15

Average Scores for Positive and Negative Groups on Ethical Situations Test

	Positive			Negative			Observed Diff. / P.E. of Diff.
	A.M.	S.D.	N	A.M.	S.D.	N	
Ethical Situations	23.98	3.61	50	24.81	3.88	50	.39
Abstract Judgment	14.32	4.22	50	15.10	4.26	50	1.38

5. Spatial Imagination

A paper folding test was given as a measure of imagination for spatial patterns. The experimenter stood before the group and folded squares of paper 8½″ x 8½″ against a black background, in such a way that all the movements could be clearly seen. The observers, without seeing the papers unfolded, were asked to reproduce on a standardized form the fold marks—that is, the complete pattern made by the creases in the paper. Eight foldings were made, each a different and successively more difficult pattern. (See Appendix III, Figure 5).

The relative difficulty of each of these patterns had already been determined in a preliminary testing of 160 individuals. On the basis of the number of individuals solving each pattern, numerical weights were assigned to each one respectively as follows: 2, 2, 3, 6, 4, 6, 9, and 30. The scores of the observers on the basis of this ranking are summarized in the following table:

TABLE 16

Average Scores for Positive and Negative Groups on Spatial Imagination Test

	Positive			Negative			Observed Diff. / P.E. of Diff.
	A.M.	S.D.	N	A.M.	S.D.	N	
Number right	3.74	1.53	50	3.58	1.83	50	.72
Weighted score	13.94	11.81	50	13.94	13.37	50	0.00

The data on this test reveal no difference between the groups. Since memory is one of the factors involved, the results are in agreement with the negligible differences obtained from the picture test.

6. University Grades

A further check on the comparative mental ability of the two groups was available in the records of the grades that these students had made in their academic courses. The average grade points for the first semester of 1925-26 were chosen for comparison. The findings are summarized in Table 17.

TABLE 17

Average Grade-Points for the Positive and Negative Groups
First Semester, 1925-26

	Positive			Negative			Observed Diff.
	A.M.	S.D.	N	A.M.	S.D.	N	P.E. of Diff.
Grade points	2.05	.73	45	2.14	.78	47	.90

It will be seen that the grade points for the two groups are nearly the same. This casts doubt upon the hypothesis that the better records of the Negative group on some of the tests are due to superior mentality.

7. Intelligence Tests

In addition to grades, every individual in the experimental groups had on record the score which he had made on the University entrance examinations. These were in terms of percentile rank. A composite intelligence percentile ranking based upon accomplishment in the three tests was secured. A comparison of the percentile rankings for the two groups is found in Table 18.

TABLE 18

Average Scores for Positive and Negative Groups on
University Entrance Examinations

	Positive			Negative			Observed Diff.
Test	A.M.	S.D.	N	A.M.	S.D.	N	P.E. of Diff.
Iowa Comprehension Test	40.48	28.14	25	65.00	25.69	25	4.77
Iowa High School Content Exam.	39.18	28.86	33	65.52	27.22	34	5.69
Thorndike Intelligence Exam.	42.30	26.88	33	56.47	28.73	34	3.09
Total Intelligence	37.57	27.82	33	64.52	28.61	34	5.77

The difference between the means for each test are statistically solid and are all in favor of the Negative group. That they could scarcely have occurred by chance is evident from the ratios of difference, all of which are large. These data fully support the assumption that the Negative group surpasses the Positive group in intelligence. The contrary evidence in the preceding table suggests the presence of some compensating factor, non-intellectual in nature, which the tests so far reported have not yet tapped.

Summary of Findings from the Tests of Intellectual Traits Tests

In every respect except that of grade points, in which no dif-

ference developed, the results favor the Negative group. While the advantage is not a decided one in most of the tests (the Aussage, Follow Directions, Ethical and Abstract Perception, and Paper Folding tests), the general trend is quite evident and is strikingly confirmed by the great divergence in the intelligence tests. It is apparent that the Negative group possesses superior mentality.

IV. Suggestibility

In planning the study one of the important considerations was the hypothesis that the center of inner values professed by the more religiously-inclined group might be a reflection of group consciousness. Assuming that a person who appeared quite open to the influences of the social group of which he had been a member might also be responsive to hints and cues in his surroundings, a laboratory approach to this question was practicable. If this supposition is correct, the persons who experience the Divine Presence should betray a higher degree of suggestibility than do the opposite type.

In order to try out this hypothesis three tests on suggestibility were devised. The results of one have already been reported in connection with the steadiness tests (p. 22). It will be recalled that neither group seem to be affected one way or the other by positive or negative instructions (Table 7, p. 24). In the same series of tests, however, the penalty of pain with the holes apparatus increased the efficiency of the Positive group to such an extent that the proportional difference in improvement between it and the Negative group was statistically significant. How much of this is due to suggestion is difficult to say because other elements of sensory and motor abilities are involved. In the following tests the attempt has been made to obtain a measure of suggestibility uninfluenced by other factors.

1. Suggestibility to Electric Current

One objective measure of suggestibility that lent itself readily for this purpose was an adaptation of the threshold test of electrical stimulation. In the electrical apparatus previously described, (page 17), the switch, which was out of view of the observer, was disconnected; the experimenter began his directions with, "Now, I am going to change the range of the instrument so that it has less power, and I want you again to report when you get the least sensation of the current. This time I expect you will begin to feel

the current right in here.'' With this, he pointed to a position somewhere in the middle range of the rheostat. The experiment then proceeded as before.

When the designated point was reached, the experimenter would look up inquiringly and ask, ''Do you feel it now?'' If the observer answered ''Yes'' the response was recorded on the data sheet and another trial made; if he answered ''No,'' the experimenter continued to move the rheostat button beyond the stated point, and kept making the inquiry repeatedly until the observer answered ''Yes'' or until the end of the rheostat had been reached. If the latter was the result, the observer's response for that trial was recorded as negative. Five such trials were made.

For the second experiment, the switch was closed again so that the observer could feel the current. The experimenter's directions were, ''The next thing I want to find out is the least perceptible difference you can observe in electric current. I want you to note carefully the sensation in your hand now. Then, as I move the button on the rheostat, as soon as you can feel the current *distinctly* stronger than it is now, say 'Now'.'' The experimenter then secretly adjusted the rheostat so that no increase in current was possible, and started the movement of the rheostat button as if to let more current pass. He kept questioning the observer, ''Do you feel it stronger now? Now?'' etc. According as the observer admitted or did not admit an increase in the strength of the current his responses were recorded ''Yes'' or ''No.'' The experiment was repeated five times. Scores were determined in terms of the number of ''Yes'' responses. The average results on both experiments are reported in Table 19.

TABLE 19

Average Scores for Positive and Negative Groups on Suggestibility to Electric Current

	Positive			Negative			Observed Diff.
	A.M.	S.D.	N	A.M.	S.D.	N	P.E. of Diff.
Suggestion without current	3.36	2.09	50	1.06	1.70	50	9.05
Suggestion with current	4.38	1.42	50	3.32	1.61	50	5.24

The difference on this test is larger than that on any other of the series. Clearly the quality of suggestibility is one of the most distinct traits of the Positive group.

2. Picture Test

The Picture Test already described on page 28 furnished another measure of suggestibility. Ten of the questions which each observer was given to answer were suggestion questions, as follows:

Are there fishing nets in the boat nearest you? (There were none.)

Did you see the man holding an oar? (There was no man.)

Was he in the boat nearest in the foreground?

Did you see the boy sitting on the ledge fishing? (There was no boy.)

Did you see the sail boat at the left of the picture? (There was no sail boat in the picture.)

Was the flag at the mast head of this boat an American or a British flag? (No flag was there.)

Is the moon reflected in the water? (There was no moon.)

Did you see the waves rolling in to the shore? (The water was calm.)

Did you see the blue of the sky reflected in the water? (The picture was entirely in values of gray, and the sky was covered with clouds.)

A suggestibility score was given each paper based on the number of these questions in which the suggestion was accepted. The average results are shown in Table 20.

TABLE 20

Average Scores for Positive and Negative Groups on Suggestion Questions of Picture Test

	Positive			Negative			Observed Diff.
	A.M.	S.D.	N	A.M.	S.D.	N	P.E. of Diff.
Suggestion errors	1.64	1.54	49	1.24	1.51	50	1.98

While the difference between the two groups is not great enough to be statistically sound, the figures indicate the same tendency that was found in the other tests. It must not be overlooked that in contrast to the suggestibility experiment with electric current, this test is quite a mixed one. It involves other factors, such as memory, perception, association, and recall, which no doubt tend to blur the susceptibility to suggestion. Under the circumstances, the data strongly reinforce the findings of the preceding tests.

Summary of Findings from Suggestibility Tests

The results of this group of tests point to but one conclusion, that the individuals comprising the Positive group are much more open to the leadings and promptings of those about them than are those of the Negative group. The tendency appears in the field of primary sensation, of visual perception, and of memory. Further experimentation in other aspects of experience would no doubt

confirm the conclusion. These findings also corroborate the statements of Dunlap[12] and other authorities, that those who experience the Divine Presence are more suggestible than other persons. They are more responsive to the appeal and the authority of others.

V. Review of Findings

In conclusion, it is time to pause and survey the distinguishing characteristics which have been discovered by this series of laboratory tests, and to consider the significance of each. In so far as the tests were able to measure the power and acuteness of the sensory processes, the only difference that proved to be statistically valid was the amount of pain that the two groups were willing to bear. Here the Negative group displayed the greater hardihood; the ratio of the observed difference to the probable error of the difference is so great that the difference itself could occur by chance only once in several thousand times. In light of the fact that the Negative group is only slightly less sensitive to minimal electric shock than the Positive, the great difference in the maximum amount of pain that they could bear seems to demand some other explanation than mere end-organ sensitivity. It may be that the Negative group was influenced to a greater degree by some strong mental impetus, as perseverance, determination, "grit," or "stick-to-itiveness"; but this is beyond the scope of the present study to determine.

With regard to the comparative motor abilities of the two groups, an interesting divergence appeared. The groups performed equally well in the more primitive types of reaction—those biologically oldest, and physiologically the most deep seated. They show little difference in simple reaction time, and in rate of tapping, except as the element of fatigue enters in, and none at all in muscle steadiness, except when stimulated by a desire to avoid pain. It may be significant that the Positive group fatigues more easily, but becomes steadier in muscle under the threat of pain. In the more complicated types of reaction, however, that is, in those involving a large degree of rational control, the Negative group is consistently quicker, more accurate, more skillful in coördination, and less easily fatigued. This is established by the significant differences in the tests for muscle coördination, serial reaction, and maze tracing.

---

[12] Dunlap, Knight, Mysticism, Freudianism, and Scientific Psychology. C. V. Mosby Co., St. Louis, Missouri, 1920. p. 42.

In mental traits the Negative group is decidedly superior. This appears not only in the intelligence tests, where the advantage is most apparent, but also in those tests which measure such auxiliary capacities as observation, memory, and association-ideation. The failure to find superiority of the Negative group in the matter of University grade-points does not militate against this conclusion, since there are undoubtedly other than purely intellectual factors involved.

The tests on suggestibility brought forth the most striking difference between the Positive and Negative groups. Under the force of suggestion the Positive group were induced to report an experience of electric shock when no actual stimulation occurred. The Negative group uniformly failed to respond to this mythical stimulus.

In a word we may say that the Positive group was more suggestible and had greater muscle steadiness when motivated by pain. The Negative group was more intelligent; they could endure more pain, were consistently quicker, more accurate, more skillful, and less easily fatigued in movements involving central coördination and control.

CHAPTER IV

PERSONAL DATA ABOUT THE RESPONDENTS

The material of the preceding chapter was derived wholly from objective measures, except in so far as the subjective element which enters into school marks may have affected the grade points of the students concerned. The present chapter presents data of the questionnaire type, which helps to provide a background to the picture of the Positive and Negative groups already drawn.

I. Traits Scores Obtained From the Rating Device

It will be recalled that the Point-Scale Self-Rating Test contained a great number of items beside the eight which were used to differentiate the mystics from the non-mystics.[13] Many of these were significant in nature, indicating by the responses such matters as home training and discipline, religious experience, types of belief, and even personal traits. Those items which appeared to measure one particular trait or characteristic were grouped and a composite score derived for each of the 549 individuals in the original test group. The reliability of these scores was determined by the usual method of dividing the items of each group into chance halves, correlating, and applying Brown's formula. The scores were then correlated with the composite score on the Divine Presence items, in order to discover any possible relationship between this experience and the respective traits. Table 21 summarizes the data.

TABLE 21

Correlations of Traits with Divine Presence Scores

Trait	Coefficient of Reliability	Correlation with Divine Presence Items
Religious Conservatism	.92	.635
Religious Training	.86	.399
Home Discipline	.62	.039
Religious Activities	.72	.678
Inferiority-Superiority	.43	.055
Optimism-Pessimism	.56	–.276
Conscientiousness	.51	.238
Fastidiousness	.44	.198
Pugnacity	.39	–.019
Kindliness, or Sociality	.56	.242
Emotional Stability	.33	.013

[13] See Appendix I.

Introvert-Extrovert	.65	–.103
Parental Sympathy	.55	.181
Aggressiveness	.37	.085
Literalism-Symbolism	.48	.189
General and Political Radical	.37	.065
Acceptance-of-Bible	.92	.532

The significant facts revealed here are the comparatively high correlations between the Divine Presence experience and religious conservatism, religious training, religious activities, and acceptance of the Bible as authority. In addition, the experience may be somewhat related to the attitude of pessimism, the trait of conscientiousness, the experience of close parental sympathy, and a belief in the literal interpretation of the Bible, although the coefficients of reliability are hardly large enough to warrant a definite statement to this effect. With reference to all other traits, the relationship is one of pure chance. The high coefficients of reliability for the items relating to religious beliefs, training and activities, and the high correlations between these items and the experience of the Divine Presence should be noted. One would naturally expect this relationship to be very close, compared with any correlation between the religious experience and other emotional or character traits.

II. Church Affiliations

The only differentiating facts revealed by the respondents about their church affiliations were that eighteen of the Catholic faith appeared in the Positive group and only one in the Negative, whereas there were only two non-church members in the Positive group but fifteen in the Negative. This division is too unusual to have occurred merely by chance. It very strongly suggests the presumption that the feeling of Divine Presence and its opposite are matters of training as much as they are matters of fundamental psychological make-up.

There was some ground accordingly for supposing that the strong tendency of the Catholics and the non-church individuals to place themselves in the Positive and Negative groups, respectively, might be a major factor determining the differences reported in the preceding chapter. In order to test this hypothesis, means were calculated for the two opposed groups after the elimination of Catholics and non-church members. No consistent or significant divergences from the conclusions of the previous chapter were found.

III. Sex Differences

Another striking contrast between the groups was in the proportion of the two sexes in each. The positive group consisted of 12 men and 38 women, as against 36 men and 14 women in the Negative group. The suspicion at once occurs that the experience or non-experience of the Divine Presence may be entangled with certain traits belonging peculiarly to one sex or the other. Pratt[14] states that the experience of coming into conscious connection with a larger life is experienced more often by girls than by boys, due perhaps to the fact that the boys are too much taken up with the objective world for inner feelings to develop. Dunlap[15] also presents the same idea and speaks of the strength of the sexual factor.

In this case there was sufficient reason to suppose that sex might be causing some of the differences between the Positive and Negative groups. Accordingly, as in the study of Catholic and non-church membership, the attempt was made to eliminate this factor.

As a first step, the average scores of Positive and Negative groups, keeping men and women separate, were determined for those tests showing large differences as originally determined. This made it possible to compare women in the Positive group with women in the Negative group; similarly the comparison was made for the men. Twenty tests, which had yielded differences three or more times their P.E.'s, were studied. For the men, the difference was in the same direction for each test as had already appeared within the entire group, although the amount of the difference varied. The same results were obtained from the women in 14 of the 20 tests. In three of the remaining tests, fatigue in tapping, the second minute of the coördination test, and the amount of time required to solve the fifth maze, the tendencies were reversed.

The above analysis shows in a rough way that the differences between Positive and Negative groups are real tendencies and not fortuitous differences resulting from the proportion of the two sexes. In a few instances, however, the sex factor is important. Thus, on ability to withstand pain, men achieve much higher scores than women. There being relatively more men in the Negative group, it follows that the Negative group appears to be more superi-

---

[14] Pratt, James Bissett, Psychology of Religious Belief. The Macmillan Co., 1916, p. 226-7.

[15] Dunlap, Knight, Mysticism, Freudianism, and Scientific Psychology. C. V. Mosby Co., St. Louis, 1920, p. 32, 39-40.

or than it really is. In an attempt to determine the exact significance of such an item irrespective of sex, the following procedure was used: The mean scores for men and for women were separately determined for the twenty most significant items. The difference between these means was added to or subtracted from the score of each individual woman so that when the mean score of all the women was recalculated it would coincide exactly with the mean score of all the men. With the scores of individual women corrected, the cases were again sorted into positive and negative groups and new means, standard deviations, and probable errors determined. If the original difference is largely due to sex, the above procedure will result in new means which will show an insignificant difference. If the original difference is not due to sex, the above procedure will not alter the significance of the difference. Below, for the reader's convenience, is tabulated a summary of the findings regarding the influence of the sex factor in the significant items.

TABLE 22

Ratios of Difference on the 20 Significant Tests Recalculated to Eliminate the Factor of Sex

Test	Gross Ratio	Corrected Ratio
Holes with pain	3.96	2.90
Maximum pain	5.67	1.47
Suggestion		
Without current	9.05	6.80
With current	5.24	5.20
Fatigue in tapping	3.80	2.10
1st minute	4.76	1.00
Last minute	3.62	.10
1st plus last minute	4.70	.70
Serial Reaction		
Time in seconds	3.60	3.10
Errors	3.15	2.90
3rd quarter	3.22	2.90
4th quarter	3.55	2.80
High School Content Examination	5.69	4.16
Iowa Comprehension Test	5.70	3.51
Thorndike Intelligence Examination	3.09	2.90
Total Intelligence	5.77	4.85
Mazes—Time in seconds		
No. 1	5.17	2.10
No. 3	3.04	.60
No. 4	3.48	2.10
No. 5	3.52	1.07

From the table it is clear that in some cases a large part of the difference in score was due to sex. Particularly is this true in the case of maximum pain, muscle coördination, and maze tests. Here the gross difference is practically erased by the correction. In a few of the tests, while the correction has brought the average scores of the two groups closer together, the differences are still outstanting. The tests of suggestion with electric current, serial reaction time, errors in serial reaction, and Thorndike's Intelligence Examination were altogether unaffected.

IV. Personal Data Questionnaire

After all the data had been gathered through the individual and group tests, a questionnaire (see Appendix II) was mailed to each of the hundred students who had coöperated in this study. The questions asked were on personal items supplementary to the experimental data. From the one hundred questionnaires sent out, 71 were returned—33 from the Positive group and 38 from the Negative. A summary of the replies on sample items is given in the following table:

TABLE 23

Tabulation of Answers to Sample Items in Personal Data Questionnaire

No.	Question	Positive Group				Negative Group			
		Yes	No	Indefinite	Blank	Yes	No	Indefinite	Blank
10	Any special temptations you have to fight?	9	20	1	3	14	17	0	6
11	Ever had visions of absent or dead friends?	11	19	1	1	4	28	3	2
12	Ever heard the voice of absent or dead friends?	3	30	0	0	1	34	0	2
13	Ever heard voices or sounds or experienced revelations or trances of any kind not accounted for by ordinary perception?	3	30	0	0	0	35	0	2
14	Ever had promptings within or inner voices not of ordinary experience?	11	19	3	2	4	31	0	2
15	Ever had any desire, weak or strong, to suffer for others?	22	10	1	0	15	19	0	3
16	Have you had times of spiritual exaltation?	18	11	0	4	1	34	0	2
17	Have you ever had times when you felt God's nearness?	32	0	0	0	3	31	0	3

22	Has your religious practice or attitude been influenced at any time by impending danger or sickness or disappointment or death of a friend or relative?	20	12	0	1	6	28	0	3

Taking up each question in detail, a number of replies are given which further help to distinguish the two groups, as well as to validate the previous rankings on the self-rating test.[16]

Questions 1 to 6. Miscellaneous data: answers too varied to use.

Question 7. The two groups agree in ranking themselves "just above the average" as to their standing in their high school graduating classes. These reports are quite comparable with their present academic achievements in the University. In grade points the two groups are equal, their average being very slightly over two.

Question 8. No important difference appeared between the groups in their proposed choice of vocation.

Questions 9 and 10. Various descriptive words were used by the respondents to characterize their dreams; but an elaborate analysis failed to disclose any real dissimilarity between the groups. The same was true for question 10, "Any special temptations you have to fight?"

Question 11. This question, concerning "visions of absent or dead friends," was interpreted in at least three different ways by those who answered it in the affirmative. Some described visual dreams, others visual images, but a third group of responses was not so easily named. There were five of these—all from the Positive group, as follows: "After my grandfather died I used to see him —that is, I thought I saw him"; "See them as if they were alive and near me"; "As I would think of one during consciousness"; "After the death of my brother I often sat in the yard thinking I was playing with him"; and "I have seen a dead friend in our home talking to me."

Question 12. "Ever heard the voice of absent or dead friends?" The two groups responded in general in the negative. One member of the Positive group stated, "I have heard what I took to be my mother's and father's voices once or twice." One from the

[16] Details of the replies to this questionnaire are available in the original manuscript on file in the Library of the University of Iowa.

Negative group answered, "Yes, I can hear my mother and others talk quite clearly." It was impossible to determine whether these two responses are to be explained as very clear auditory imagery or as hallucinatory experiences.

Question 13. "Ever heard voices or sounds or experienced revelations or trances of any kind not accounted for by ordinary perception?" This was answered affirmatively by three of the Positive group. One wrote, "After the death of a baby brother, I used to think I saw him at night among the clouds." The other two used vague and contradictory terms with little meaning. This was due no doubt to the fact that the experience was largely emotional, hence difficult to describe. As an explanation, one of them suggested, "These noises were accounted for because I was scared terribly a long time ago by the unnoticeable appearance of a man." The other explains, "When I am by myself, in some quiet place, thinking or praying, I have often felt some strange absent awe."

Question 14. Of those who acknowledged the experience of "promptings within or inner voices not of ordinary experience," two, a Positive and a Negative, explained that they were prompted by their conscience. Two others, one from each group, attributed the experience to "something within" and the "inner self." Two more from the Negative, and nine from the Positive group, described the experience in terms of divine promptings.

Question 15. Of the thirty-seven who indicated by their answers to this question that they had had the desire to suffer for others, fourteen Positives and ten Negatives stated a willingness to exchange places with suffering parents, near relatives, fiancées, children in trouble, and the weaker who were being oppressed by the stronger. The kind of suffering they were willing to undergo, whether physical or mental or both, was not indicated. Two others, both Negatives, wrote that they would feel sorry for one going through humiliation and would prefer to bear the unpleasantness for him. The remainder, eight Positives and five Negatives, definitely referred to real physical discomfort or torture.

Question 16. "Have you had times of spiritual exaltation?" Only two of the twenty-one who answered this question affirmatively belonged to the Negative group. One of these described her experiences more as "mental exaltation" than as "spiritual exaltation"

in the common sense of the term; ". . . Viewing a lovely scene—a fresh morning—reading a beautiful psalm—or a bit of fine literature—an interesting picture." The other had known the experience only once—after an attendance at a revival meeting. To quote, "I had the most pleasant feeling inside of me. I felt as though something bad or dirty or some disease had left me. It was the happiest feeling I have ever had and I felt almost twenty pounds lighter."

Question 17. Only three of the Negatives state that they had ever felt God's nearness. They describe the experience as follows: "During childhood—years 12 to 14"; "At time of conversion—some inner feeling and changed attitude toward God"; and "When I was very, very sick." Thirty of the Positive group describe such experiences. For the sake of brevity, only a few characteristic quotations are given here: "In time of sorrow when someone was needed to lean upon." "I always have a sense of the nearness and protection of God under all circumstances." "In times of accident and sickness I am sure He was near and heard and answered my prayer." "Feeling of protection and guidance. Hardly a thing I could describe in words."

Question 18. "Describe in some detail the religious surroundings and experiences of your childhood." In responding to a general statement of this kind, it is to be expected that many details important in one's life will be overlooked. Likewise, two people who have had very similar surroundings and experiences might not record the same details. In checking the replies, each individual detail was tabulated. These items, together with the number of students noting each, are given in the following table.

TABLE 24

Religious Surroundings and Experiences

	Positive	Negative
Family worship	3	2
Attended Sunday School	18	29
Attended church	17	15
Church membership	2	2
Childhood prayers	6	1
Grace at meals	2	1
Home training in religion	6	1
Father religious	2	3
Mother religious	6	4

Parents attend church	5	1
Confirmed	2	2
Father a church member	3	3
Mother a church member	3	4
Learned catechism	2	1
Strict Catholic environment	5	1
Active in Christian Endeaor	1	0
Taught Sunday School	1	0
Read Bible daily	1	0
Baptized	0	1

More of the Negative group stated that they had attended Sunday School; but the Positive group seem to have been brought up in homes which gave more attention to expressions of formal religion.

Question 19. "What changes have occurred in your religious beliefs and attitudes?" Only two items of significance were found here: Fourteen of the Positive group, as against one of the Negative group, declared that they were gradually changing to a broader view of religion. The Negative group has already taken that step. Eleven of them state that they are turning to doubt, as against one of the Positive group.

A few state the age at which the changes occurred and the circumstances accompanying them. Four give as the most significant time in their "gradual change to a broader view" years 15-17. Two others state that it was the time spent in the University. Two changed since entering the University from a literal to a free interpretation of the Bible. One lost his belief in a future heaven and hell at the age of 14. The two who rebelled against religious services did so at the ages of 14 and 16-18. Those who had gone over to atheism did so at the ages 10-11, 9-17, 14, and 17. Of those whose beliefs had given way to doubt, four stated the ages of 12-18, 15-18, 14, and 16 respectively. Two others indicated that doubt had first arisen in connection with the study of evolution; and four gave the time of doubt more generally as during their attendance at the University. One states that the change from sympathy to indifference toward religion came since his enrollment in the University; another, with the study of evolution. On the contrary, two write that their attitudes have changed from antagonism to sympathy since they entered the University, and another declares his beliefs have been growing stronger during his University career.

Question 20. "Give an account of any marked religious experiences

you have had." Only two of the Negative group responded to this: "Religion, where I did embrace 'marked experiences,' was the most private of all my thoughts"; and "I had a thrill for a few days after a supposed conversion at the age of 8 to 10, but it wore off and I felt the same as ever." Five persons of the Positive group replied as follows: "All my prayers have been answered regarding deep serious trouble." "At the time of conversion I experienced a great satisfaction and a state of restfulness of mind which has never left me." "The only marked experiences have been the absolute answer to all my prayers." "At the age of seven I received the Sacrament of the Holy Eucharist for the first time. This was probably the greatest experience of my life. At the age of 12 I received the sacrament of confirmation which gave me strength to carry on through life under the cross of Christ." "More than my share of social and economic misfortunes resulting in almost a tremor of religion followed by additional strength in religion and general morals."

Question 21. The inquiry, "What is your present attitude toward religion?" brought forth responses which on the whole were quite characteristic of the two groups. Most of the members of the Positive group declare their faith in religion and state their belief in its necessity, its importance, its comforting influence, its uplifting power, and its teachings. On the other hand, the reports of the Negative group indicate with but a few exceptions, disbelief, indifference, doubt, disgust, lack of faith, agnosticism, fear, and atheism. The responses to this question are quite illuminating, but are too numerous and individual in character to be given here.

Question 22. "Has your religious practice or attitude been influenced at any time by impending danger or sickness or disappointment or death of a friend or relative?" Sixteen of the Positive and six of the Negative groups answered in the affirmative. The reports, on the whole, show that serious troubles have tended to strengthen the religious convictions of the mystics, but to weaken those of the Negatives.

Question 23. "What reactions against religion have you experienced, if any, and what marked antipathies or antagonisms have you felt that are not described in the above account?" This question was answered in the affirmative by nine of the Positive and sixteen of the Negative groups.

Review of Findings in Chapter iv

Those who experience the Divine Presence rate themselves as conservative in religious beliefs. They accept the Bible as authority, and are inclined to take its meaning literally. They have had religious home training and are still engaged in religious activities. The guidance given to them by their parents has been sympathetic and tactful. They seem to be a bit conscientious, fastidious, and pessimistic. In all these respects the Negative group displays the opposite characteristics.

The Catholic element predominates in the Positive group, and the Negative group has an excess of non-church members. But this does not seem to have overloaded the differences brought out by the laboratory tests. When the averages are struck exclusive of Catholics and non-church members, the differences still remain unchanged.

The data indicate that women are more subject to the experience of the Divine Presence than men, and that sex differences play a clear, though minor rôle in the religious life.

As might be expected, the Positive group reports a rich and varied assortment of experiences, more interesting than the phenomena of ordinary perception. Many more of them have had "marked religious experiences:" times of spiritual exaltation, and distinct moments when they felt the nearness of God. In their homes more attention was given to religious practice and observances. A number of them are gradually feeling their way to a broader view of religion. Their whole attitude toward religion is positive, while that of the Negative group is almost entirely antagonistic. Crises in life seem to have strengthened the religious convictions of the Positive group but to have weakened those of the Negative group. The former are less reactionary against religion than the latter. In short, the Positive group feel at home within the folds of organized religion, while the non-mystics are indifferent or estranged.

CHAPTER V

REVIEW AND STATEMENT OF CONCLUSIONS

When two types of individuals can be so clearly differentiated as were the mystics and non-mystics of this study, certain fundamental traits in the psychological make-up of each ought to be apparent. What clear-cut differences emerge from the experimentation to which the one hundred individuals of this investigation were subjected? For the sake of presenting these in the light of the whole study, a summary of the findings is given in the following table.

TABLE 25

Summary of Findings

Nature and Degree of Difference Between the Positive and Negative Groups on All Tests

Tests	Positive Group Compared with Negative Group	Observed Diff. / P.E. of Diff.
SENSORY DISCRIMINATION		
Visual Discrimination		
Number right	more	1.86
Errors	more	.77
Weight Discrimination		
Number right	more	.32
Errors	more	1.00
Sensitivity to Electric Current		
1st sensation	more sensitive	1.69
1st pain	more sensitive	1.88
Maximum pain	less	5.67
Auditory Discrimination		
Rhythm	poorer	1.66
Pitch	poorer	.02
Intensity	better	.54
Time	poorer	1.10
Consonance	better	.20
MOTOR ABILITIES		
Simple Reaction Time	slower	1.87
Rate of Continuous Movement		
1st minute	slower	.75
Last minute	slower	2.23
1st divided by last minute	more fatigued	3.80

Tests	Positive Group Compared with Negative Group	Observed Diff. / P.E. of Diff.
1st plus last minute	slower	1.63
Muscle Steadiness		
Holes with positive directions	less steady	.15
Holes with negative directions	more steady	.59
Holes with pain	more steady	3.96
Trough with positive directions	more steady	.85
Trough with negative directions	less steady	.27
Trough with pain	more steady	.45
Eye-Hand Coördination		
1st minute	poorer	6.92
Last minute	poorer	6.16
1st divided by last minute	greater gain	1.26
1st plus last minute	poorer	6.54
Serial Reaction		
Time	slower	3.60
Errors	more	3.15
1st quarter	more	1.89
2nd quarter	more	2.88
3rd quarter	more	3.22
4th quarter	more	3.55
Tracing Mazes		
No. 1	slower	5.17
No. 2	slower	1.81
No. 3	slower	3.04
No. 4	slower	3.48
No. 5	slower	3.52
INTELLECTUAL TRAITS		
Memory		
The Picture Test	poorer	1.55
Aussage		
Number right	less	1.65
Number wrong or repeated	more	.55
Follow Written Directions		
Number followed	less	1.01
Number wrong	more	2.83
Ethical Discrimination	poorer	.39
Abstract Judgment	poorer	1.38
Spatial Imagination—Paper Folding		
Number right	more	.72
Point score	equal	0.00
University Grade Points	less	.90
Intelligence Tests		
Iowa Comprehension Test	poorer	4.77
Iowa High School Content Exam.	poorer	5.69
Thorndike Intelligence Test	poorer	3.09
Total Intelligence	poorer	5.77

Tests	Positive Group Compared with Negative Group	Observed Diff. / P.E. of Diff.
SUGGESTIBILITY		
Without Electric Current	greater	9.05
With Electric Current	greater	5.24
Picture Test—Suggestion Questions wrong	greater	1.98

Among these results, only those which record a difference that is at least three times its probable error may be regarded as really substantial. In addition, some of these are caused by the fact that the Positive group contained a majority of women, while men predominated in the Negative group. When the data on the tests of maximum pain, muscle coördination, and maze running are corrected for this factor, the difference between the groups practically disappears. This leaves the following abilities in which the Negative group is decidedly superior: general motility as measured by rate of tapping, eye-hand coördination, serial reaction, general intelligence, and resistance to suggestibility.

The results of the self-rating tests and of the personal-items questionnaire supplement and in part explain these findings. The members of the Positive group have been brought up in homes in which religious practices are commonly observed; they have had religious training, and are still active in religious work. In belief they are conservative, tending to accept the Bible literally as authority. They have "visions," hear "voices" and sounds, and experience other revelations not accounted for by ordinary perception. They report times of spiritual exaltation, feelings of God's nearness, and other experiences of a marked religious type. Crises in life apparently have strengthened their religious faith; and many of them feel that they are coming gradually to a broader view of religion. The greater willingness that they express "to suffer for others" may indicate that they are more socially-minded. Seventy-six per cent of this group are women.

In contrast, those who classify themselves as non-mystics have come from homes in which little attention was given to the forms of organized religion. They have had little formal religious training and do not participate in religious activities. In belief they are radical, questioning the Bible and its authority, and in general turning from the tenets of orthodox faith. Few of them report the experience of visions, "voices," or other semi-ecstatic phenome-

na; nor do they acknowledge the feeling of God's nearness, of spiritual exaltation, or other distinctively religious experiences. The crises in their lives have increased their inclination towards non-religion; and many of them are now in a state of doubt or decided antagonism. Seventy-four per cent are men.

In attempting to plot in diagrammatic form the contrasts just presented, Figure 6 was constructed. (See Appendix III, Figure 6). The circles represent the two groups of students, as indicated. The comparative lengths of the line-segments connecting the two indicate roughly the relative amounts of the trait possessed by each group.

At first thought the facts might be taken to indicate considerable superiority on the part of the non-mystics. But the better showing of the Negative group in certain kinds of specific abilities, and even in the intelligence tests, need not necessarily be interpreted as evidence of a higher type of mentality. The mentality may be of a different kind, or at least, organized on a different emotional basis and derived from another set of experiences. And it is conceivable that the Positive group, possessing a more intimate feeling of inwardness of experience, may be heading toward a richer integration of selfhood that will bring efficiency and release of power. This can be determined only by following their development through a period of years or by supplementing the present study of young people in college life by a cross-section picture of more mature-minded men and women.

But there are certain evidences that the mystics are already finding ways to compensate for the disabilities which the tests indicate. Notwithstanding their poor showing on the intelligence tests and their inferiority in motor capacities, they have kept pace in University grades with the non-mystics who are more richly endowed. From the standpoint of achievement they are not inferior.

With less native speed and alertness, therefore, how have the mystics managed to hold their own? The tests suggest that they are more open to the motivating influences that the University seeks to cast around its students. They improve quickly under threat of punishment. They respond to hints and promptings from those about them. More used to appreciative understanding, and perhaps more socially-minded, they go at problems with a positive mental set. Their attitude toward religion is sympathetic;

and their continued participation in religious activities implies a striving for that which is ethically and morally right.

Does the mystic experience play a part in this? From their confessions it is evident that the experiences themselves are satisfying, uplifting, and strengthening to the individuals. Beyond this it is altogether probable that they bring a feeling of adjustment and peace which enables the individuals to use more effectively the relatively inferior capacities which, according to the tests, they seem to have. This conclusion awaits further investigation before it can be made with certainty.

It must not be supposed that the findings of this research are applicable to all who do or do not experience the Divine Presence. They are known to be representative of students at the State University of Iowa, and it is reasonable to expect that they would hold true for other groups of similar age, environment, and attainments. Tentatively held, they may serve as the basis for further investigation, and the discovery of more universal conclusions.

BIBLIOGRAPHY

1. Coe, George A. *The Spiritual Life,* Eaton and Mains, N. Y., 1900.
2. Drummond, Henry. *Natural Law in the Spiritual World.* Hovendon Company, N. Y.
3. Dunlap, Knight. *Mysticism, Freudianism, and Scientific Psychology.* C. V. Mosby Company, St. Louis, 1920.
4. Hartshorne, Hugh. Measurements of Growth in Religion. *Religious Education,* XIV, 1919, pp. 148-155.
5. Illingworth, J. R. *Christian Character.* Macmillan, London, 1903.
6. Illingworth, J. R. *Divine Transcendence.* Macmillan, London, 1911.
7. Inge, William Ralph. *Christian Mysticism.* Scribner's, N. Y., 1899.
8. Inge, William Ralph. *Outspoken Essays.* Longmans Green, London, 1925. Chapter 9.
9. Inge, William Ralph. *Types of Christian Saintliness.* Longmans Green, N. Y., 1915.
10. Inge, William Ralph. *English Mystics.* John Murray, London, 1907.
11. Jacks, L. P. *The Lost Radiance of the Christian Religion.* Doran, N. Y., 1924.
12. Jacks, L. P. *Religious Perplexities.* Doran, N. Y., 1923.
13. James, William. *Varieties of Religious Experience.* Longmans Green, N. Y., 1903.
14. Jones, Rufus M. *Fundamental Ends of Life.* Macmillan, 1924.
15. Jones, Rufus M. Mystic's Experience of God. *Atlantic Monthly,* 128: 637-45; November, 1921.
16. Jones, Rufus M. *Studies in Mystical Religion.* Macmillan, 1909.
17. Knight, Rachel. *The Founder of Quakerism.* Swarthmore Press, London, 1922.
18. Leuba, James H. The Contents of Religious Consciousness, *Monist,* XI, pp. 533-573.
19. Leuba, James H. Introduction to a Psychological Study of Religion. *Monist,* XI, pp. 195-255.
20. Leuba, James H. On the Psychology of a Group of Christian Mystics. *Mind,* NS., XIV, pp. 15-27.
21. Leuba, James H. *The Psychology of Religious Mysticism.* Harcourt Brace, London, 1925.
22. Leuba, James H. Religion; Its Impulses and Its Ends. *Bibliotheca Scara,* LVIII, pp. 757-769.
23. Pratt, James Bissett. *Psychology of Religious Belief.* Macmillan, 1916.
24. Pratt, James Bissett. *The Religious Consciousness.* Macmillan, N. Y., 1920.
25. Royce, Josiah. *The Problem of Christianity.* Macmillan, 1913.
26. Royce, Josiah. *Sources of Religious Insight.* Scribner's, N. Y., 1912.
27. Royce, Josiah. *The World and the Individual.* Vol. I, p. 81, Macmillan, N. Y., 1912.

28. Starbuck, E. D. The Intimate Senses as Sources of Wisdom. *Journal of Religion*, I, No. 2, March, 1921.
29. Starbuck, E. D. *The Psychology of Religion.* Scribner's, N. Y., 1911.
30. Underhill, Evelyn. *Mysticism.* Dutton, N. Y., 1912.
31. Underhill, Evelyn. *Mystic Way.* Dutton, N. Y., 1913.

APPENDIX I

BELIEFS AND ATTITUDES

Below are pairs of opposite qualities or traits. The dotted line between each pair is a scale on which you are asked to rate yourself. If you think you have equal amounts of both qualities or that you are about the average human being, check the colon; if more of one than the other, check to the right or to the left of the colon as far as best represents your case.

For example, if you should have quite light hair your statement of that item might be like this:

Very dark hair . . . : . . / . Very light hair

If the stories of Abraham Lincoln are true it is likely he might have rated himself with respect to kindliness or cruelty something like the following:

Kindliness ./ . . : . . . Cruelty

Check always on a dot or on the colon rather than between them.

Begin slowly. See what each item means before you check. When you get the swing of it you can speed up. Work hard. Make sure that each judgment is correct.

1	Very dark hair	. . . : . . .	Very light hair
2	Very light eyes	. . . : . . .	Very dark eyes
3	Extremely blonde complexion	. . . : . . .	Extremely brunette complexion
4	Always healthful	. . . : . . .	Extremely delicate in health
5	Avoid using slang	. . . : . . .	Use slang a great deal
6	Work systematically	. . . : . . .	Work without system
7	Emotionally explosive	. . . : . . .	Emotionally well poised
8	Faithful in work	. . . : . . .	Neglectful of work
9	Believe in socialism	. . . : . . .	Am against socialism
10	Enjoy sermons	. . . : . . .	Dislike sermons
11	Careful in workmanship	. . . : . . .	Careless in workmanship
12	Extremely fond of children	. . . : . . .	Dislike children
13	Lose head in dangerous circumstances	. . . : . . .	Keep cool in dangerous circumstances
14	Warm and friendly with others	. . . : . . .	Too antagonistic toward others
15	Much given to anger	. . . : . . .	Decidedly even tempered
16	Strong feeling of being inferior to others	. . . : . . .	Strong tendency to feel superior to others
17	Bashful and retiring	. . . : . . .	Bold and forward
18	God seems remote	. . . : . . .	God seems near

19	Tendency to be secretive	. . . : . . .	Open and frank
20	No faith in prayer	. . . : . . .	Implicit faith in prayer
21	Often tardy or lax in keeping appointments	. . . : . . .	Prompt in keeping appointments
22	Sympathetic with doctrines of church	. . . : . . .	Antagonistic to doctrines of church
23	No concern about others	. . . : . . .	Wide sympathy with others
24	Work best alone	. . . : . . .	Work best with others
25	Like to keep quiet in company with others	. . . : . . .	Like to be a leader in company with others
26	Always return money when receiving too much change	. . . : . . .	Never return money when receiving too much change
27	Never lend	. . . : . . .	Generous in lending to any one who asks
28	An easy mark for a good salesman	. . . : . . .	Can't be sold anything I do not want
29	Keep troubles to myself	. . . : . . .	Tell troubles freely to others
30	Most preachers play on the superstitions of people	. . . : . . .	Most preachers are sincere
31	Public officials are for most part honest	. . . : . . .	Public officials are for most part playing politics
32	Religious progress must come through the churches	. . . : . . .	Religious progress must come chiefly outside the churches
33	I give liberally to charity	. . . : . . .	I dodge requests for charity
34	Usually feel depressed	. . . : . . .	Usually feel elated
35	Father always sympathetic with my ideas	. . . : . . .	Father usually unsympathetic with my ideas
36	Mother always sympathetic with my ideas	. . . : . . .	Mother usually unsympathetic with my ideas
37	Fear what lies beyond death	. . . : . . .	Look forward with pleasure to it
38	Unusually thoughtful of others	. . . : . . .	Too unmindful of others
39	Feel in harmony with divine purpose	. . . : . . .	Feel out of harmony with divine purpose
40	Desire to succeed financially	. . . : . . .	More interested in other things
41	Take commands or discipline cheerfully	. . . : . . .	Ignore commands or discipline
42	Thoughts chiefly about self	. . . : . . .	Mind on other things than self
43	Shirk chores and duties at home	. . . : . . .	Conscientious and faithful at duties
44	Morbidly conscientious	. . . : . . .	Chronically irresponsible
45	Home discipline severe	. . . : . . .	Home discipline gentle

46	Approve use of tobacco in others	. . . : . . .	Detest use of tobacco in others
47	Use tobacco habitually	. . . : . . .	Conscientiously opposed to it
48	Strongly favor conscientious objectors of war	. . . : . . .	Antagonistic toward conscientious objectors
49	Detest use of slang in others	. . . : . . .	Enjoy hearing slang in others
50	Christians are better than non-Christians	. . . : . . .	Non-Christians are better than Christians
51	Should cling to the faith of our fathers	. . . : . . .	Should depart from the faith of our fathers
52	Dreams tend to be depressing	. . . : . . .	Dreams tend to be uplifting
53	Like to speak in public	. . . : . . .	Dislike to speak in public
54	Conduct conforms with ideals	. . . : . . .	Conduct much at variance with ideals
55	No tendency to blush	. . . : . . .	Much tendency to blush
56	Confident and fearless	. . . : . . .	Troubled with doubts and fears
57	Aggressive	. . . : . . .	Easy going
58	Persistent in an undertaking	. . . : . . .	Shifting from one thing to another
59	Resting upon what you are told	. . . : . . .	Fondness for finding out things for yourself
60	The churches teach that Jesus actually changed water into wine	. . . : . . .	They teach it as figurative
61	The churches require the literal interpretation of the New Testament miracles	. . . : . . .	They require only a symbolic interpretation
62	Believe the Old Testament story of creation	. . . : . . .	Disbelieve it
63	Sympathetic with doctrines of church	. . . : . . .	Antagonistic to doctrines of church
64	Believe the Bible infallible	. . . : . . .	Disbelieve it
65	Believe that death ends all	. . . : . . .	Disbelieve it
66	Believe that religion is largely superstition	. . . : . . .	Disbelieve it
67	Believe in the resurrection	. . . : . . .	Disbelieve it
68	Believe in the Deity of Jesus Christ	. . . : . . .	Disbelieve it
69	Believe that Jesus Christ was born of a virgin	. . . : . . .	Disbelieve it
70	Believe Lazarus was raised from the dead	. . . : . . .	Disbelieve it
71	Believe that Jesus walked on the water	. . . : . . .	Disbelieve it

The following scale differs from the above in that the colon is at the end. It denotes simply the absence of the quality or trait indicated at the other end of the line. The end away from the colon denotes the extreme as before. Check your position on each item.

72	Punished often during childhood	..... :	Never punished during childhood
73	Punished severely during childhood	..... :	Punishment not severe
74	Often feel guilt or remorse for wrongdoing	..... :	Never feel guilt or remorse
75	Have sometimes felt the presence of the Holy Spirit	..... :	No such experience
76	Brought up to attend Young People's Societies regularly	..... :	Brought up to attend Young People's societies not at all
77	Attend Y.P.S. regularly now	..... :	Do not attend Y.P.S. now
78	Greatly upset by misfortune	..... :	Unmoved by misfortune
79	Bothered about unfinished work	..... :	Let it rest
80	Widely sympathetic with others	..... :	Not sympathetic with others
81	Strict discipline in home	..... :	Discipline in home slack
82	Have had moments of satisfaction of immediate communion with a Divine Presence	..... :	No such experience
83	Often jealous of others	..... :	Never feel jealous
84	Very often submissive	..... :	Never submit
85	Very strong desire to assert self	..... :	No such desire
86	Religion an important part of daily life now	..... :	Pay no attention to religion in daily life now
87	Have intimate feeling of God's love	..... :	Do not have such feeling
88	Aggressive in debate and discussion	..... :	Passive in debate and discussion
89	Distinctly religious home influence	..... :	Atmosphere of home not religious
90	Habit of praying during childhood	..... :	Never prayed in childhood
91	Consistent in prayer now	..... :	Never pray
92	Family entered seriously into family worship	..... :	No family worship
93	Brought up to attend church regularly	..... :	Brought up to attend church not at all

94	Brought up to attend Sunday School regularly	. . . . . :	Brought up to attend Sunday School not at all
95	Father much interested in church	. . . . . :	Father indifferent to church
96	Mother much interested in church	. . . . . :	Mother indifferent to church
97	Attend Sunday School regularly now	. . . . . :	Do not attend Sunday School now
98	Implicit faith in prayer	. . . . . :	Never faith in prayer
99	Useless thoughts continually bothering	. . . . . :	Never experience them
100	Sometimes have moments of great inspiration	. . . . . :	Never have such experience
101	Very active in religious work	. . . . . :	Not active in religious work
102	Enjoyed warm companionship with my father	. . . . . :	No such companionship
103	Enjoyed warm companionship with my mother	. . . . . :	No such companionship
104	Have a satisfying inner experience in religion	. . . . . :	No such experience
105	Seem to have divine leadings and promptings	. . . . . :	No such leadings and promptings
106	Seek to know God's will	. . . . . :	No such effort
107	God sometimes seems very real	. . . . . :	No such experience
108	High respect for the Bible as authority	. . . . . :	Indifferent to the authority of the Bible
109	Prayers usually answered	. . . . . :	Prayers apparently never answered
110	Have great missionary zeal	. . . . . :	No missionary interest
111	Worry about exams	. . . . . :	Do not worry about exams
112	Brood over troubles	. . . . . :	Usually carefree
113	Much misunderstood by parents	. . . . . :	No such difficulty
114	Keen feeling of rivalry	. . . . . :	No feeling of rivalry
115	Interested in helping others	. . . . . :	Not interested in helping others
116	Afraid of the wrath of God	. . . . . :	No such fear
117	Have hope of a happy life hereafter	. . . . . :	No such hope
118	Strict religious observance in home	. . . . . :	No attention paid to religion in home

Put a check *before* the words that appeal most to you as applying to God or the Universe or whatever you consider to be the essential Reality of the World.

Power	Mind	Toiler with mankind	Order
Father	Loving	Force for Good	Shepherd
Chance	Law	The Indwelling	Creator
King	Universe	Law as God's thought	Energy
Judge	Mystery	All powerful	Jehovah
Forgiving	Comforter	A way of speaking	Chaos
Punisher	All wise	Mechanism	Force
Ruler	God	Merciful	Purpose

Now *underscore* the words in the above list that seem to you the worst.

How many children in your family .....

Your position in the family line, 1st, 2nd, 3rd, etc. .....

Church connection or preference, if any .....

Was "confirmed" (yes or no) ..... At what age .....

Have experienced "conversion" (yes or no) ..... At what age .....

Father's occupation .....

Place of your birth ..... Brought up in town or country .....

If in town or city, approximately what population .....

Age ..... Sex .....

Father's nationality ..... Mother's nationality .....

Name .....

APPENDIX II

PERSONAL ITEMS SUPPLEMENTARY TO EXPERIMENTAL DATA

We appreciate very much your coöperation in securing some psychological data in the laboratory. We need some additional facts. It will help us if you will kindly react to the following items. The statements you make will be held in strict confidence. Please mail your replies as promptly as possible in the enclosed stamped envelope.

Use the backs of these sheets and any other paper you need to make your answers complete.

1 Name in full..... Height..... Weight.....
2 Games you like best .....
3 Sports you engage in most .....
4 Teams to which you have belonged .....
5 Honors or victories you have won in athletics .....
6 When you have a holiday how are you most apt to use it? .....
7 Your standing in your high school graduating class: (Check)
Lowest 20% ..... Just below average ..... Average .....
Just above average ..... Highest 20% .....
8 Vocation you expect to follow or to which you incline .....
9 What is the character of your dreams? .....
10 Any special temptations you have to fight? ..... Describe .....
11 Ever had visions of absent or dead friends? ..... Describe .....
12 Ever heard the voice of absent or dead friends? ..... Describe .....
13 Ever heard voices or sounds or experienced revelations or trances of any kind not accounted for by ordinary perception? ..... Describe .....
14 Ever had promptings within or inner voices not of ordinary experience? ..... Describe .....
15 Ever had any desire, weak or strong, to suffer for others? .....
Describe .....
16 Have you had times of spiritual exaltation? ..... Describe .....
17 Have you had times when you felt God's nearness ..... Describe .....
18 Describe in some detail the religious surroundings and experiences of your childhood .....
19 What changes have occurred in your religious beliefs and attitudes? Describe the periods one by one, giving the age and circumstances of each .....
20 Give an account of any marked religious experiences you have had.....
21 What is your present attitude toward religion? .....
22 Has your religious practice or attitude been influenced at any time by impending danger or sickness or disappointment or death of a friend or relative? ..... Describe .....
23 What reactions against religion have you experienced, if any, and what marked antipathies or antagonisms have you felt, that are not described in the above account? .....

APPENDIX III

APPARATUS USED

Figure 1. Apparatus for measuring sensitivity to electric current, also suggestibility.

Figure 2. Measuring muscle steadiness.

Figure 3. Picture used in testing memory, also suggestibility.

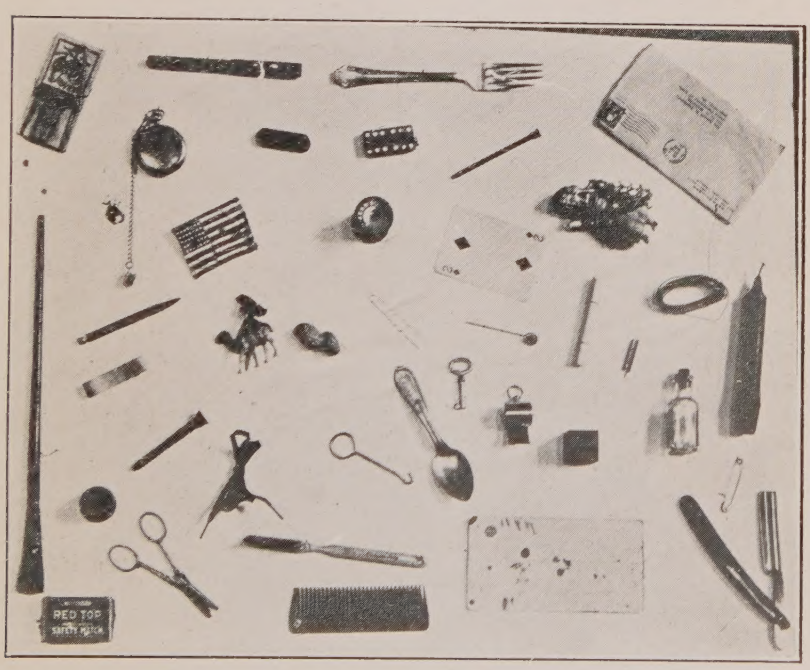


Figure 4. Lay-out for Aussage test of memory.

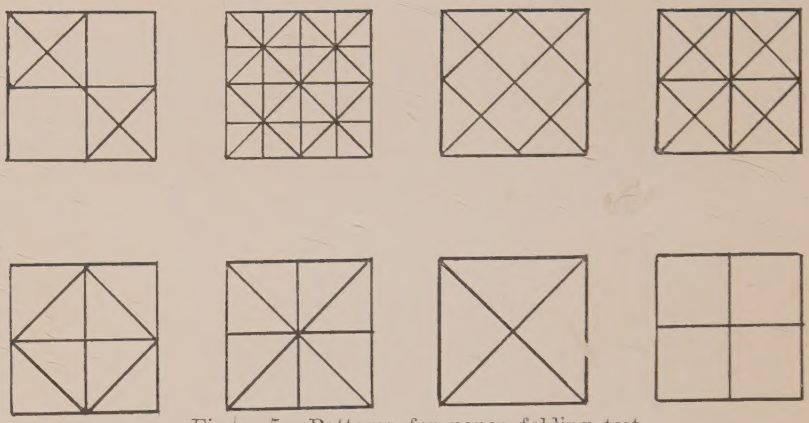


Figure 5. Patterns for paper folding test.

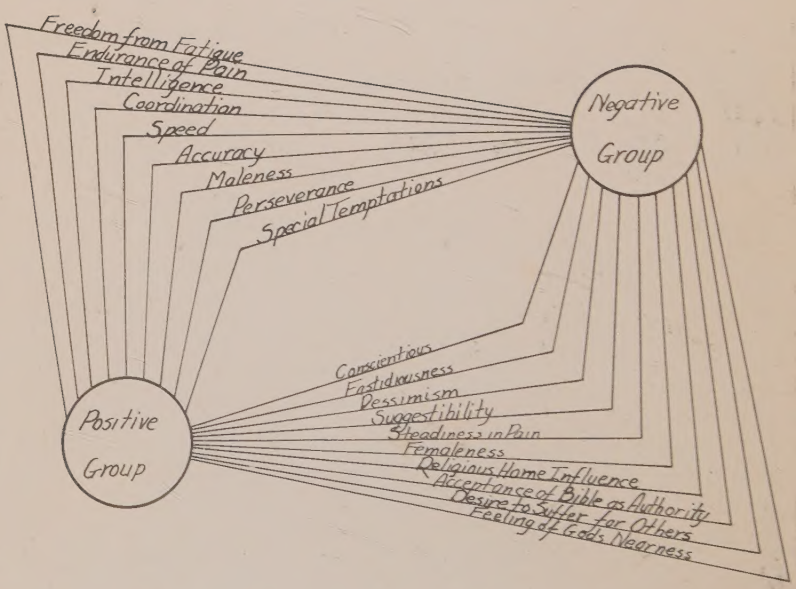


Figure 6

Figure 6. Schematic diagram of relations of the two groups.

GTU Library
3 2400 00713 3303

Date Due

FE 3'54			
OC 10 59			

GTU Library
2400 Ridge Road
Berkeley, CA 94709
For renewals call (510) 649-2500
All items are subject to recall

Sinclair, Robert D. PV53.5
I09
v.2,no

Obtainable from Department of

Publications: Price, $1.00